CLAIMS

1. A TRF2 DNA-binding domain mutant protein comprising:

(a) a TRF2 DNA-binding domain mutant protein having an amino acid sequence as shown in SEQ ID NO: 2 but with at least one substitution selected from the group consisting of substitution of the lysine residue with arginine at position 10, substitution of the alanine residue with serine at position 34, substitution of the alanine residue with serine at position 47 and substitution of the arginine residue with lysine at position 59; or

(b) a TRF2 DNA-binding domain mutant protein having an amino acid sequence of the mutant protein of (a) above but with one or several amino acid residues other than the amino acid residues at positions 10, 34, 47 and 59 being deleted, substituted or added, and which has a higher binding ability to a duplex DNA comprising a sequence represented by 5'-TTAGGG-3' than a wild-type TRF2 DNA-binding domain protein having an amino acid sequence as shown in SEQ ID NO: 2; or

a salt of (a) or (b).

2. The TRF2 DNA-binding domain mutant protein or a salt thereof according to claim 1, wherein the mutant protein of (a) is any one of the following (ia) to (via):

(ia) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the lysine residue at position 10 being substituted with arginine;

(iia) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the alanine residue at position 34 being substituted with serine;

(iiia) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the alanine residue at position 47 being substituted with serine;

(iva) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the arginine residue at position 59 being substituted with lysine;

(va) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the lysine residue at position 10 being substituted with arginine, the alanine residue at position 34 being substituted with serine, the alanine residue at position 47 being substituted with serine and the arginine residue at position 59 being substituted with

lysine;
(via) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the lysine residue at position 10 being substituted with arginine and the alanine residue at position 47 being substituted with serine;
(viia) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the alanine residue at position 34 being substituted with serine and the alanine residue at position 47 being substituted with serine; or
(viiia) a protein having an amino acid sequence as shown in SEQ ID NO: 2 but with the lysine residue at position 10 being substituted with arginine, the alanine residue at position 34 being substituted with serine and the alanine residue at position 47 being substituted with serine.

3. An isolated DNA encoding the protein according to claim 1.

4. A recombinant vector comprising the DNA according to claim 3.

5. A transformant comprising the recombinant vector according to claim 4.

6. A method of producing a TRF2 DNA-binding domain mutant protein, comprising culturing a host transformed with the DNA according to claim 3 and recovering the TRF2 DNA-binding domain mutant protein from the resultant culture.

7. An antibody to the TRF2 DNA-binding domain mutant protein or a salt thereof according to claim 1.

8. A protein comprising the TRF2 DNA-binding domain mutant protein according to claim 1; or a salt thereof.

9. A complex of the protein according to claim 1 or 8 and a DNA.

10. A DNA having a nucleotide sequence as shown in SEQ ID NO: 17 but with at least one substitution selected from the group consisting of substitution of the T

at position 3 with G, substitution of the G at position 7 to C and substitution of the T at position 9 to G.

11. The DNA according to claim 10, which is any one of the following (ib) to (iiib):

(ib) a DNA having a nucleotide sequence as shown in SEQ ID NO: 17 with the T at position 3 being substituted with G;

(iib) a DNA having a nucleotide sequence as shown in SEQ ID NO: 17 with the G at position 7 being substituted with C; or

(iiib) a DNA having a nucleotide sequence as shown in SEQ ID NO: 17 with the T at position 9 being substituted with G.

12. A method of screening for substances which are capable of regulating the binding of telomeric DNA to TRF2, comprising analyzing whether or not a TRF2 DNA-binding domain having an amino acid sequence as shown in SEQ ID NO: 2 or a protein comprising said domain interacts with a test substance at least at one amino acid site selected from the group consisting of the lysine residue at position 10, the alanine residue at position 34, the alanine residue at position 47 and the arginine residue at position 59, wherein said test substance is judged to be capable of regulating the binding of telomeric DNA to TRF2 when said test substance interacted with said domain or said protein.

13. The method according to claim 12, wherein whether or not a TRF2 DNA-binding domain having an amino acid sequence as shown in SEQ ID NO: 2 or a protein comprising said domain interacts with a test substance at least at one amino acid site selected from the group consisting of the lysine residue at position 10, the alanine residue at position 34, the alanine residue at position 47 and the arginine residue at position 59 is analyzed in the presence of a duplex DNA comprising a sequence represented by 5'-TTAGGG-3'.